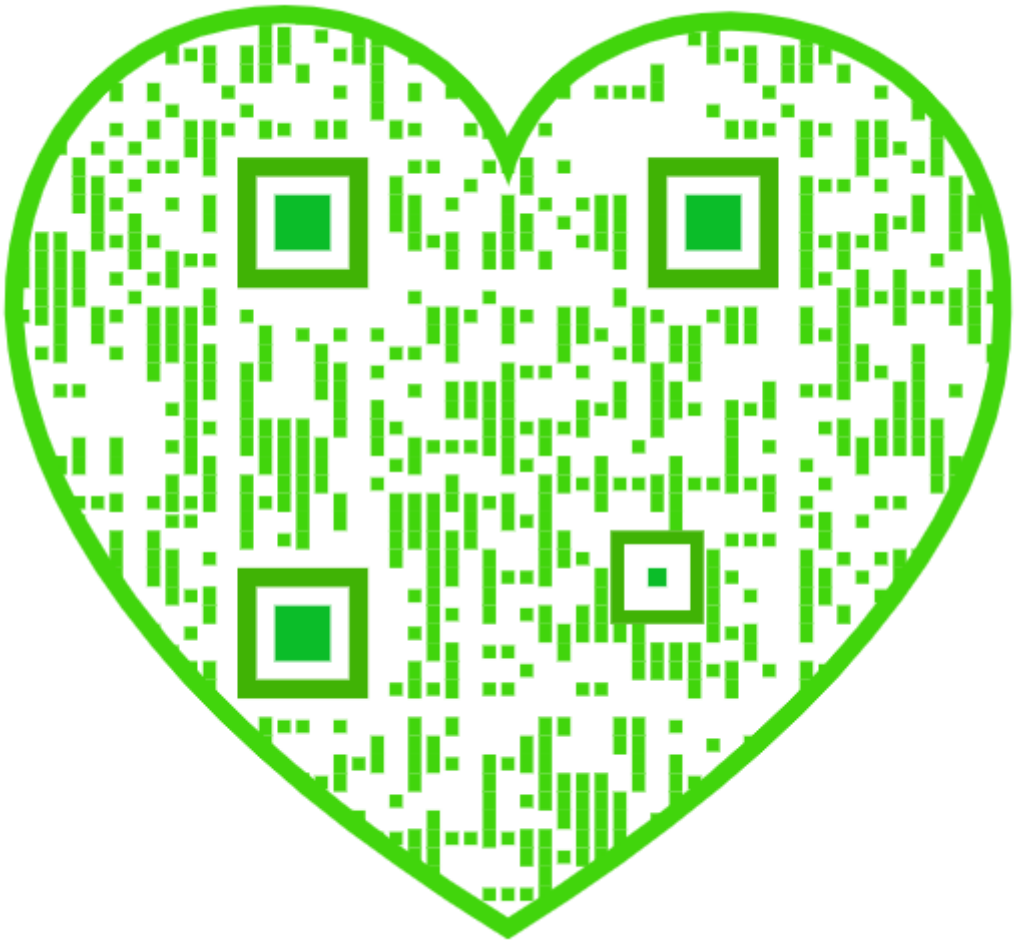

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AMERICAN MUSEUM OF NATURAL HISTORY

The Musical Instruments of the Incas

BY

Charles W. Mead

Assistant, Department of Archæology

SUPPLEMENT TO AMERICAN MUSEUM JOURNAL
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The Musical Instruments of the Incas

A Guide Leaflet to the Collection on Exhibition
in the
American Museum of Natural History

By

CHARLES W. MEAD
Assistant in Archæology

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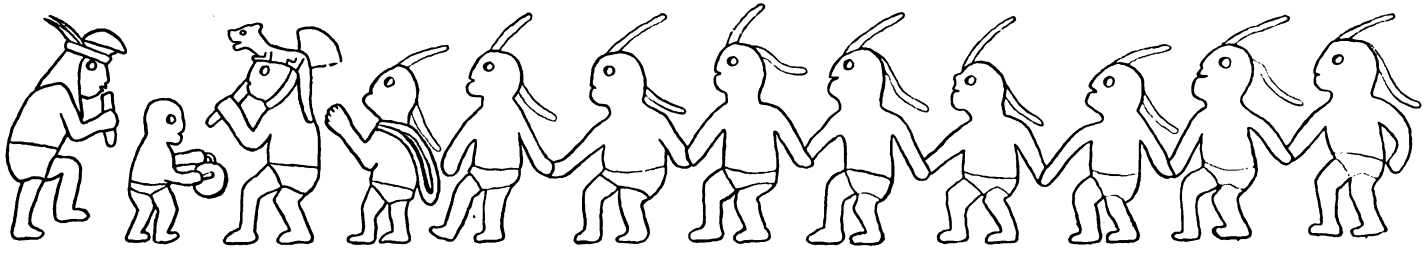


FIGURE 1

FIGURE 2

PLATE I. DECORATIONS FROM ANCIENT PERUVIAN TERRA COTTA VESSELS

THE MUSICAL INSTRUMENTS OF THE INCAS.

By Charles W. Mead,

Assistant, Department of Archæology.

INTRODUCTION

Ancient Peru, the land of the Incas, extended, according to the historians, Garcilasso de la Vega [1] and Prescott, [2] from about the second degree of north latitude to the Maule River in Chile, about the thirty-sixth degree of south latitude. The country included the region now comprised within the Republic of Peru, and the greater part of Ecuador, Bolivia and Chile, and was nearly equal in size to that part of the United States east of the Rocky Mountains. The Incas had no written language, and no small part of our knowledge of their customs has been derived from their practice of representing the scenes of daily life in the decoration of their pottery vessels. In the study of the musical instruments in particular, the decorations on the pottery of the ancient Peruvians is important, because the Spanish conquerers of the land and their followers have left in their accounts but little information bearing upon the subject. From the pottery and other objects found in the ancient tombs and burial places, therefore, we have derived most of our knowledge of the musical instruments of the Incas, and the present discussion is based upon a study of the prehistoric Peruvian collections in the American Museum of Natural History. In these collections there are not only many of the musical instruments themselves, but also artifacts, principally pottery vessels, decorated with figures of men in the act of playing upon such instruments.

It is commonly said that "Peru is a puzzle"; and certainly this may be truthfully said of its music. Although we find recorded a number of characteristic songs, known to the Peruvian Indians for nearly two hundred years, we cannot say positively of any one of them that it is wholly pre-Spanish. Dr. von

[1] Royal Commentaries of Peru. Ed. Rycaut, Part I, Book I, Chap. III.

[2] Conquest of Peru, Vol. I, p. 28.

Tschudi has published three Peruvian elegiac songs or *haravis* [1] which he says "might serve to test the musical knowledge of the ancient Peruvians," but an examination of these pieces is very disappointing. Carl Engel remarks:

"At all events they must have been tampered with, as they exhibit exactly the form of the Spanish *bolero*. Even allowing that the melodies of these compositions have been derived from Peruvian *haravis*, it is impossible to determine with any degree of certainty how much in them has been retained of the original tunes, and how much has been supplied besides the harmony, which is entirely an addition of the European arranger." [2]

The first and simplest element of music is rhythm, and in singing or dancing a desire for some sound that shall clearly mark it is universal; hence, in the absence of musical instruments, the custom of snapping the fingers, clapping the hands, beating the hips and stamping the feet; and I am inclined to follow Rowbotham [3] in believing that the art of instrumental music in prehistoric times passed through three stages, which may be designated the "drum" type, the "pipe" type, and the "lyre" type. The first type includes all instruments of percussion, as drums, rattles, gongs, castanets, etc.; the second, all wind instruments, and the third, all stringed instruments. In support of this theory he cites the evidence furnished by the mechanical complexity of the instruments themselves. The drum is the simplest form; the pipe is more complex than the drum; and the lyre, which makes use of stretched strings, is the most complex of all.

That the drum was the first instrument of primitive man is strenuously opposed by Wallaschek, who says:

"The most ancient discoveries (from the youth of mankind) of flutes and pipes, but not of drums, are definite facts which no speculation can put aside, and I am rather inclined to believe that Wagener was correct in saying that a wind instrument was undoubtedly the first." [4]

[1] Antigüedades Peruanas, pp. 135, 136.
[2] Musical Instruments, p. 79.
[3] Journal Anthro. Institute Gr. Brit. and Ireland, Vol. X, pp. 380–381.
[4] Primitive Music, p. 84.

The entire absence of drums and the large number of flutes in the prehistoric Peruvian collections in museums would seem to support this claim in Peru were it not for the fact that numerous pottery vessels decorated with figures in the act of beating the drum are found with mummies in the ancient graves. (See Plates I and II.)

The fact that a tribe has flutes and no drums is not proof that their earliest instrument was not the drum. There are well-known cases of the "dropping out" of musical instruments In Guatemala the *marimba* has become a national instrument Professor O. T. Mason, referring to this instrument, says:

> "In one case we have a musical instrument imported by negro slaves given to the Indians with its native African name and abandoned by the negroes themselves." [1]

INSTRUMENTS OF PERCUSSION.

Drum

In instruments of this class the drum undoubtedly held the first place, although, as has been stated, none has been found in the ancient graves up to the present time. This may be accounted for by the perishable material of which they were made; or, through the existence of some superstition on account of which they may never have been buried with the dead. However this may be, the numerous representations on pottery vessels, and the accounts of early writers, give us a pretty accurate idea of their form and construction.

The drums appear to be identical with those in use in many parts of Peru to-day and were made by stretching a skin over a hoop of wood or over one end of a short section of the trunk of a tree which had been hollowed out to a thin cylinder. These two forms of drum are shown on Plate II, where two men (figs. 7 and 10) are beating very thin drums, which would seem to represent the hoop form, while another drummer (fig. 9) plays upon one much thicker, which is probably of the second type. Judging from these representations, the drums would not exceed fourteen or fifteen inches in diameter. We are told frequently by early writers that small drums were used on different occasions; but

[1] American Anthropologist, Vol. X, No. 11.

no mention of larger ones, so common in many Indian tribes, has been found. The Abbé Molina, describing the method of curing the sick, says:

"The *Machi* directs the women who are present to sing with a loud voice a doleful song, accompanied with the sound of some little drums, which they beat at the same time." [1]

Doubtless the heads of these drums were usually made of the skin of the deer and other animals common to the country, but this was not always the case. The Huancas "flayed the captives they took in war, making some of the skins into drums." [2] Garcilasso says:

"They were a sort of fierce and warlike people fleaing those whom they took in the wars, the skins of which they filled with ashes and hanged them up in the temples for trophies; with the skins of some they make drums, being of opinion that the sound of them would terrify their enemies." [3]

Copper bells, in form resembling our sleigh-bells, appear to have been in common use. Figs. 2, 3, and 4 of Plate II show three, each of which has a pebble in the cavity. Fig. 1 shows a flattened form, decorated on either side with a figure, probably representing the sun. This bell has been broken, and the pebble or "clapper" is missing. Cieza de Leon, who is perhaps the most reliable of the contemporaneous writers, remarks:

Bell

"When the chiefs [Guayaquil, Ecuador] were sick, to appease the wrath of their gods, and pray for health, they made other sacrifices of a superstitious nature; killing men (as I was told), and believing that human blood was a grateful offering. In doing these things they sounded drums and bells before certain idols shaped like lions and tigers, which they worshipped." [4]

In the Museum collection there are three bronze objects, circular in outline and slightly concavo-convex, each having a

[1] History of Chili, p. 92.
[2] Travels of Cieza de Leon, Ed. Hakluyt, Part I, p. 299.
[3] Royal Commentaries of Peru, Ed. Rycaut, Part I, Book VI, Chap. X.
[4] Travels of Cieza de Leon, Ed. Hakluyt, Part I, p. 203.

PLATE II

projection perforated for suspension. When struck with any hard substance, they give out a remarkably clear and resonant sound. One of these is shown as fig. 12 of Plate II. It is three and seven-eighths inches in diameter. Ewbank, describing Señor Barboza's collection of Peruvian antiquities, figures three of these objects, two of which he states are of copper and one of bronze. He says: "I took them for mirrors; but they do not seem to have been polished."[1] None of the three in the Museum shows any indication, on either side, of having been polished, and there seems to be no reason to doubt that they were used as gongs or bells.

Rattle and Cymbal

Of the various forms of rattles it is hardly necessary to speak in detail. They consisted of small shells and nuts, seeds of a species of laurel tree, etc., and were often strung together. (See Plate II, fig. 8 and Plate III, figs. 5, 7, 8.) These were attached to the wrists, ankles and other parts of the body in dancing. A common form of rattle was a gourd containing seeds or pebbles. The use of shells as paint cups or palettes was very common, as is attested by numerous specimens, which still contain paint, found in graves; but their use as musical instruments in ancient Peru, has not been noticed before. Figs. 5 and 6 of Plate II represent water vessels of terra cotta, decorated with figures striking shells together, as cymbals are played. The "cymbals" are so well modeled that there can be no doubt that they represent Spondylus (*Spondylus pictorum*, Chem.) shells. (See Plate II, fig. 11).

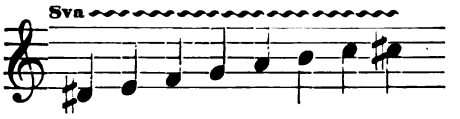
WIND INSTRUMENTS.

Syrinx or Pan-pipe

LONG before the conquest the Peruvians had emerged from the first or drum stage, and reached the second, which C. K. Wead defines as that "having instruments mechanically capable of furnishing a scale"[2]—a tremendous stride in the art. The most important instruments of this class are the syrinx or Pan-pipe (*huayra puhura*) and the flutes of bone and cane. Fig. 7 of Plate IV shows a syrinx

[1] Life in Brazil, Appendix, p. 454.

[2] Contrib. to the Hist. of Musical Scales, Rep. U. S. Nat. Mus., 1900, p. 421.

consisting of eight reeds of graduated lengths, held in position by a crosspiece of split cane lashed to the reeds with a cord made of the wool of the llama. This pipe has all the reeds open at the lower ends, and yields the following scale:

Other Pan-pipes are found with reeds closed at the lower end; and still another form has a double set of the same dimensions, —one set open at the bottom and the other closed, those of corresponding length being placed opposite each other. By this arrangement octaves are produced, the closing of a pipe at one end, as is well known, lowering its pitch an octave. This same law is utilized by the modern organ builder in the employment of the so-called open and stopped diapasons.

A curious and unique syrinx of stone is shown as fig. 3 of Plate III. The illustration is made from a plaster cast. The original, which was procured by the French general Paroissien, is made of greenish talc, and is said to have been found on a mummy in a Peruvian tomb. This interesting specimen has been described at length by Carl Engel.[1] Figs. 1 and 2 of Plate IV represent water jars, in human form, made of terra cotta; both figures are represented in the act of playing the Pan-pipes. Garcilasso says:

"In music they arrived to a certain harmony, in which the Indians of Colla did more particularly excel, having been the inventors of a certain pipe made of canes glued together, every one of which having a different note of higher and lower, in the manner of organs, made a pleasing music by the dissonancy of sounds: treble, tenor and bass, exactly corresponding and answering each to other; with these pipes they often played in consort, and made tolerable music, though they wanted the quavers, semiquavers, airs, and many voices which perfect the harmony amongst us." [2]

These pipes are as popular with the modern Indians as they

[1] Musical Instruments, p. 66.

[2] Royal Commentaries of Peru, Ed. Rycaut, Part I, Book II, Chap. XIV.

were with their ancestors in the days of the Incas. Indian couriers frequently use this instrument to announce their arrival and departure, as the post-horn was used by the driver or guard of a mail coach in England, and as it is now used by a New York coaching party.

E. G. Squier, who witnessed the *chuño* or potato festival of the Aymará Indians, says:

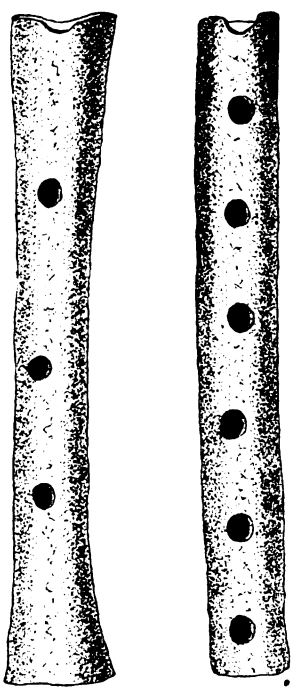
"Each group danced vigorously to its united music, which made up in volume what it lacked in melody—wild and piercing, yet lugubrious: the shrill pipe [Pan-pipe] and the dull drum, with frequent blasts on cow's horns by amateurs among the spectators, filled the ear with discordant sounds. Every man seemed anxious to excel his neighbor in the energy of his movements, which were often extravagant; but the motions of the women were slow and stately. The music had its cadences, and its emphatic parts were marked by corresponding emphatic movements in the dance. The 'devilish music' that Cortez heard after his first repulse before Mexico, lasting the livelong night, and which curdled his blood with horror, while his captured companions were sacrificed to Huitzlipochtli, the Aztec war-god, could not be stranger or more fascinating, more weird or savage, than that which rung in our ears during the rest of our stay in Tiahuanaco." [1]

Lieut. Gibbon describes the "church performances" of the Aymará Indians thus:

"The wind-instruments are made of a succession of reeds of different sizes and lengths [Pan-pipes], upon which they blow a noise, little resembling music to our ear, keeping time with the drummers, the slow-motioned dancers respecting them both. . . . The women again appeared, each bringing with her a jar of *chicha*, which they served out in cups, giving to each individual as much as he could drink, which was no small quantity, for the morning was cold. The music again struck up, and the women again joined in the dance. One of them came out with her sleeping 'wawa' slung to her back, which soon commenced a laughable discord; but not a smile could be discovered in any of their faces; neither did the woman stop till the dance was ended." [2]

[1] Travel and Exploration in the Land of the Incas, pp. 306, 307.
[2] Exploration of the Valley of the Amazon, Part II, pp. 117, 118.

Bearing this description in mind, it will be interesting to turn to Plate I, fig. 2, which represents figures of men and women in relief, forming a band around a pottery water vessel. There is every reason to believe that the potter who moulded these figures was gathered to his fathers long before the coming of the Spaniards, yet he depicts the identical scene described by Lieut. Gibbon after so great a lapse of time; showing how such customs persist with these Indians. The musicians play upon Pan-pipes and the drum. The woman with her "wawa" (baby) strapped to her back is here, nor are the jars of chicha wanting. Chicha is a fermented drink made of maize, and is still the national drink of the Indians. J. S. Skinner relates that,



BONE FLUTES ¼

"In alternation of dancing, singing, and drinking they remain for several days and nights without intermission, until all the jars are empty. Father Figueroa pleasantly observes that he is at a loss to conjecture how they have a head for so much noise, a throat for so much exclamation, and a tooth for so much liquor." [1]

Flute

On Plate V, twenty-six flutes are represented. Nos. 1, 2 and 3 are of cane; Nos. 7, 8 and 9 are made from the wing bone (ulna) of the pelican; Nos. 11, 12, 14, 15 and 16 from combined ulna and radius of the llama; No. 13 is a small gourd. All the others are made from the ulnæ of deer. They are simply tubes, open throughout their length, and all belong to the class known as "end-blown."

In playing, the breath, crossing the opening at the upper end, impinges on the sharp edge, which is often notched, setting up vibration in the column of air within the instrument, thus producing the sound. It is a well-known law that the frequency of vibration,

[1] Present State of Peru, p. 290.

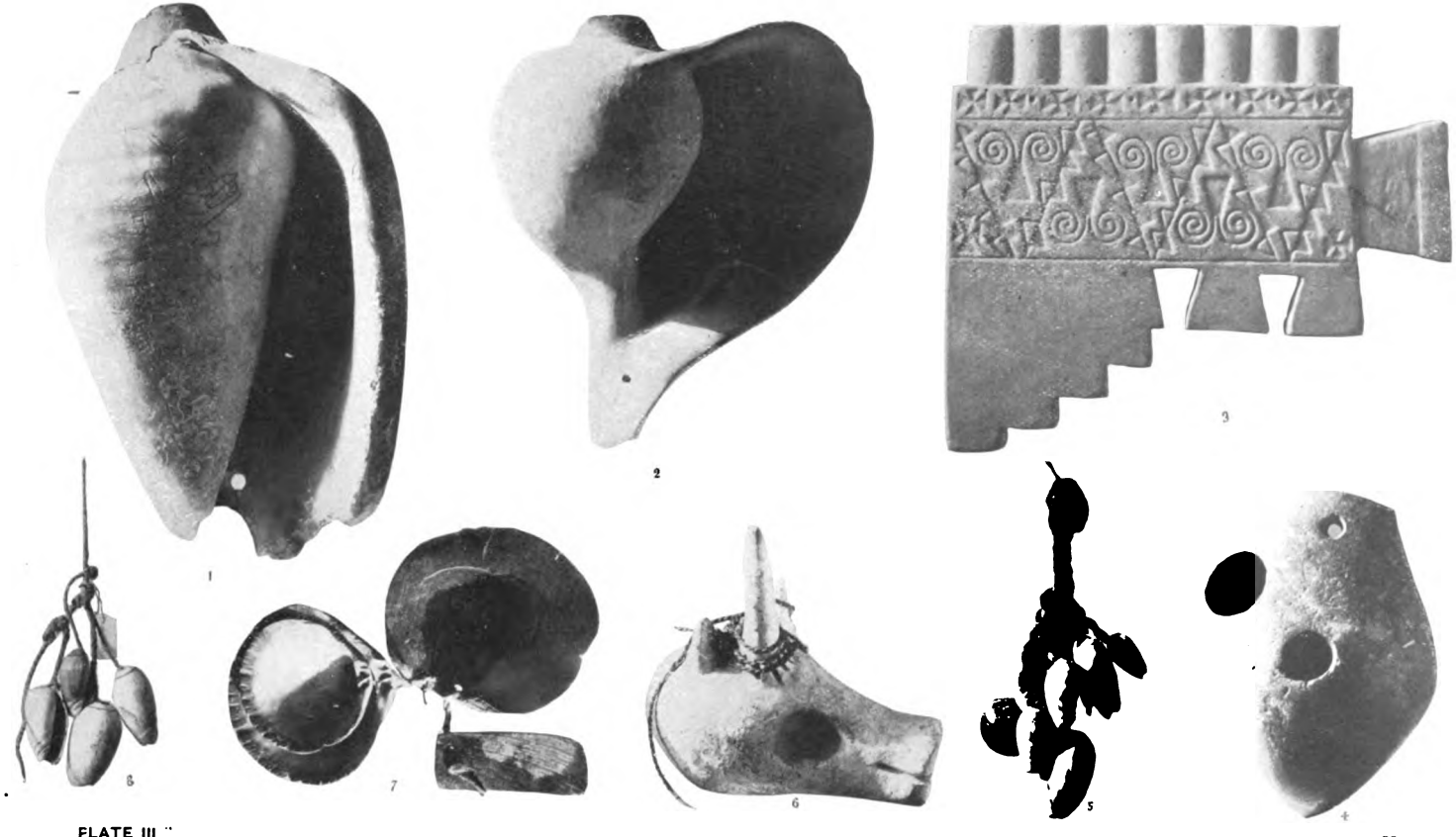


PLATE III

or, in other words, the pitch of a note produced, depends chiefly on the length of the column of air within the flute.

In the flutes represented the vents or holes for changing the length of the vibrating column of air vary in number from three to seven. In those made of cane they are all on the upper side, while the bone flutes often have one of the holes on the under side, which was closed by the thumb. Nos. 4, 5, 6, 10, 11, 14 and 17 to 26 are of the latter kind.

All attempts to discover any rule or law governing the positions of the openings or vents have been unsuccessful. A first glance at several of these flutes, particularly those made of cane, gives the impression that an attempt at equal spacing had been made; but a second shows such a variation in distances that this seems doubtful. The bone flutes (figs. 25 and 26, Plate V) are of the same length, yet a great difference in the position of the holes is apparent at a glance. We are led to the conclusion that these ancient flute-makers were not governed by set laws, but that each made his instrument according to his own idea. That the tones produced are in false key-relationship is not to be wondered at when we consider the imperfections in their construction; in fact, the flutes are sadly out of tune. What the late John Comfort Fillmore wrote of the Omaha Indian flageolet applies equally to these flutes:

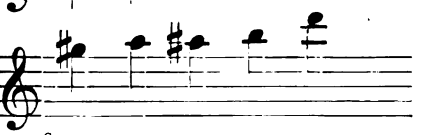
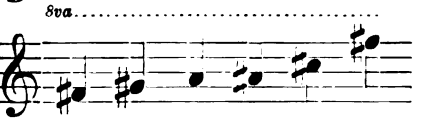
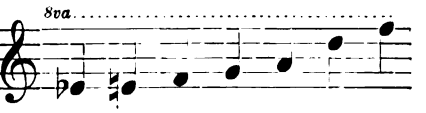
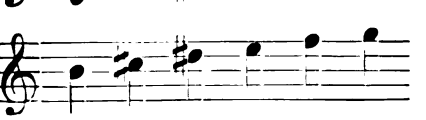
"The imperfections are plainly due to the limitations, not of the Indian's perception, so much as of his scientific knowledge. The flageolet is evidently built 'by guess,' and only remotely approximates to the Indian voice in accuracy of intonation." [1]

Those acquainted with the difficulties that beset the maker of a flute at the present day will see nothing strange in the lack of method in the location of the vents in the flutes of these ancient Peruvians. Mr. Wead remarks:

"In practice these holes never can open so freely to the outside air that the portion of the tube beyond them may be considered as removed (the possibility or necessity of cross-fingering proves this

[1] Omaha Indian Music, Alice C. Fletcher, Appendix, p. 73.

DESCRIPTIONS OF FLUTES REPRESENTED ON PLATE V.

Figure.	Museum No.	Length in inches.	Material.	Scale.
1	B 3852	$15^{13}/_{16}$	Cane	
2	B 8139	$10^{1}/_{8}$	"	
3	B 8138	$9^{7}/_{8}$	"	
4	B 3509	$3^{7}/_{16}$	Bone	
5	B 382	4	"	
6	B 505^{B}	$4^{3}/_{8}$	"	
7	B 3848	5	"	
8	B 3846	$4^{9}/_{16}$	"	
9	B 3847	$4^{9}/_{16}$	"	
10	B 618	$6^{1}/_{4}$	"	
11	B 7945	$5^{1}/_{4}$	"	
12	B 7951	$7^{1}/_{8}$	"	

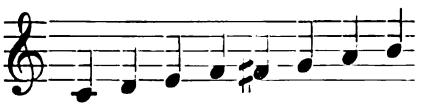
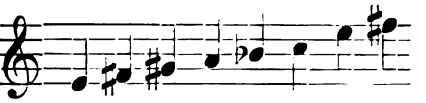
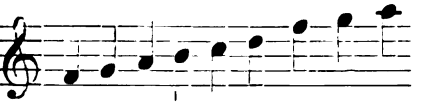
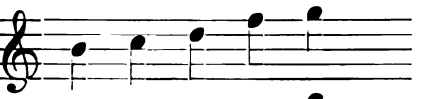
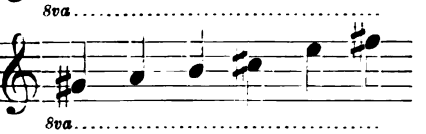
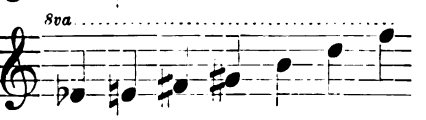
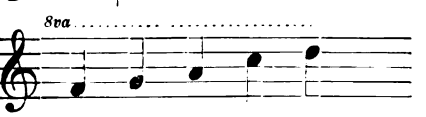
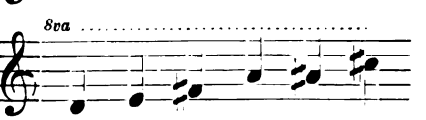
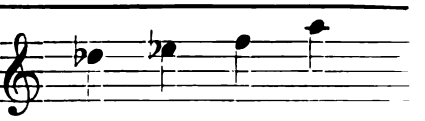
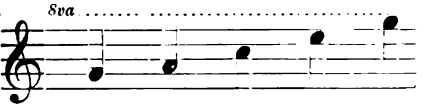
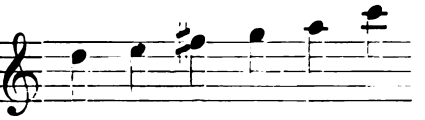
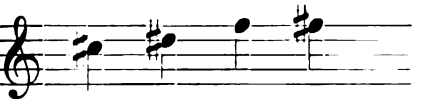
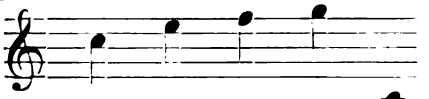
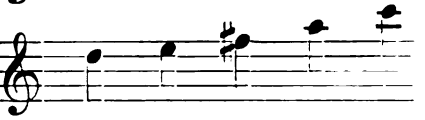
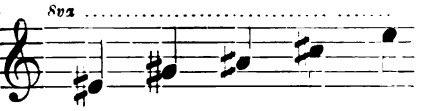
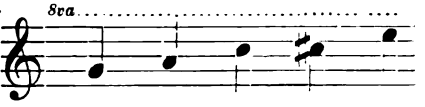
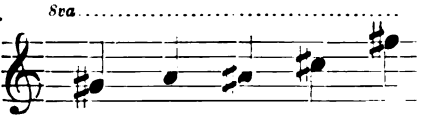
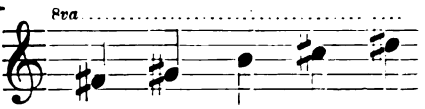
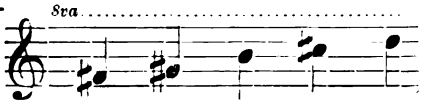
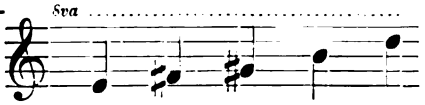
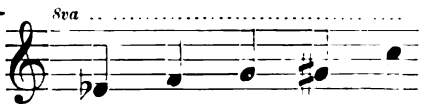
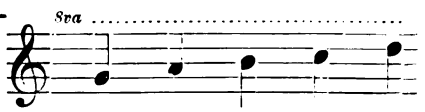



Figure.	Museum No.	Length in inches.	Material.	Scale.
13	B 8013	3	Gourd	
14	B 4929	$6\frac{1}{8}$	Bone	
15	B 2648^{A}	$6\frac{7}{8}$	"	
16	B 2648^{B}	8	"	
17	B 7944	$6\frac{3}{4}$	"	
18	B 7954	5	"	
19	B 7955	$4\frac{1}{2}$	"	
20	B 7948	$4\frac{1}{4}$	"	
21	B 619	4	"	
22	B 7949	$5\frac{3}{8}$	"	
23	B 505^{A}	$4\frac{5}{8}$	"	
24	B 7946	6	"	
25	B 505^{C}	$5\frac{1}{4}$	"	
26	B 750	$5\frac{1}{4}$	"	

to the player), so the proper location and diameter of the holes to produce the notes of our scale of even quality are fixed, not by a simple law, as the frets on the guitar are located, but by laborious experimenting to get a standard instrument which is then reproduced with Chinese fidelity." [1]

The question arises, Were the intervals produced on these flutes satisfactory to the Indian? That the first attempt was not so in very many cases, we know from the indisputable evidence of his work. Fig. 4 of Plate V shows the under side of a flute. It will be seen that the original thumb hole has been closed (by a stopper made of gourd) and another perforated above it. No. 7 has had four of the six original holes plugged and others bored near them,—only traces of the gourd plugs remaining. No. 17 shows plainly the plug in the original hole, and the vent which was afterward made above it. No. 19 shows two sets of holes. Of the plugs, only traces remain; but the one in the under side (thumb hole) is still in as perfect condition as those to be seen in figs. 17 and 21. In No. 20 they have entirely disappeared. The scales of the twenty-six flutes shown on Plate V are given on pages 18 and 19. They have been carefully determined in conformity with the international pitch: vibration-number $a^1 = 435$.

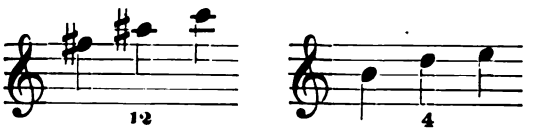
Many of the tones produced from these instruments only approximate, in pitch, to some one of the notes of our familiar twelve-tone piano scale. In many instances the variation amounts to nearly a quarter of a tone. Considering the age and condition of these flutes, it is safe to say that in some cases the scales given here are incomplete, and this applies particularly to those made of cane.

No. 14 of this set appears much longer than it really is,—the bird figures being carved on a prolongation of one side of the bone, below the tube.

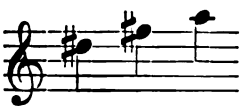
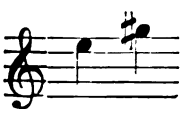
Nos. 4, 11 and 12, represented on Plate IV, may be classed with the flutes. No. 12 is made from a shell (*Fasciolaria princeps*, Sowb.). It has two vents: one perforated through the top of the spire, the other in its side. No. 4 is an imitation of a shell in terra cotta. It is decorated with a human face and

[1] Contrib. to the Hist. of Musical Scales, Rep. U. S. Nat. Mus., 1900, p. 426.

PLATE IV

geometrical designs, which are not shown in the illustration. The scales of these flutes are given below:

No. 11, also of terra cotta, is broken and the scale cannot be ascertained. These instruments are sounded by the breath impinging on the sharp edge of the outer lip of the shell.

Resonator Whistle

Whistles of the resonator class have a wide distribution and have been found in different sections of Peru. They are usually made of terra cotta, but sometimes of other materials. The kind most commonly met with emit but one or two tones and generally go by the name of "signal whistles" or "bird-calls." The resonator type reached its highest form of development in Chiriqui and parts of Central America, where they commonly took the human form or that of some well-known animal or bird, and in most cases the grotesque element predominated in the representation. The openings (vents) to the air chamber in the body of these instruments vary in number, but seldom exceed four. On Plate IV, figure 13 shows an instrument of this class. This specimen is one and three-eighths inches high, and measures two and three-quarters inches from the nose to the tip of the tail. Its two vents are on the same side, yielding the following scale:

No. 15, on the same plate, is of wood and has one vent. Its tones are:

No. 6, on Plate III, and Nos. 8, 10, and 14 on Plate IV, are without vents and have but one note each.

Whymper, who gives an excellent account of the Incan remains in Ecuador, figures three of these whistles grotesquely resembling the human form. He has this to say of them:

"Then there are the musical pottery whistles, delightfully ugly things, which are sometimes more useful to carry than letters of introduction. Simple airs can be got out of them, and on the homeward journey my people lightened the way by playing on these primitive instruments." [1]

GOLD ORNAMENT FROM ICA, PERU. ½

Trumpet

The trumpet in its various forms is undoubtedly one of the most ancient of wind instruments, and its distribution in prehistoric times was all but universal. Two forms of this instrument were common in Peru: the conch and a trumpet of terra cotta. Both of these forms are shown in the accompanying figure.

This illustration shows the ornamentation on one side of a gold ornament found in a prehistoric grave at Ica, Peru. It is double-convex in form, consisting of two thin, concavo-convex pieces which are not joined by solder, as is sometimes the case in ornaments of this kind, but are held together by the edges of one of the pieces being turned tightly over the other. The figures are in *repoussé* work.

Fig. 1 of Plate III represents a remarkably fine specimen of the shell trumpet. It has a copper mouth-piece, and is ornamented with an engraved figure of a warrior. The shell is a *Strombus galeatus*, Swains. Unfortunately the mouth-piece

[1] Travels amongst the Great Andes of the Equator, p. 281.

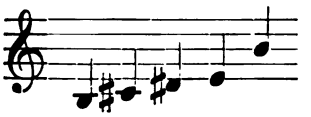
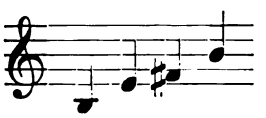
is so badly corroded that the scale of the instrument cannot be ascertained. Fig. 2, on the same plate, is of a trumpet of terra cotta, and is one of several in the collection in which the shell form has been reproduced in clay. It would seem that this was frequently done when shells could not be obtained. This specimen is in perfect condition. Its scale is as follows:

The lowest or fundamental tone is produced on the open instrument; the next step above in the scale, by introducing the hand a short distance into the opening of the "shell." For the next higher note the hand is pushed still farther into the cavity, and so on until the highest tone of the instrument is reached. In the older natural or French horn, the so-called stopped tones are obtained in much the same way.

Fig. 9 of Plate IV represents a clay trumpet similar to that represented on the gold ornament from Ica figured on page 24; the only difference is the shape of the "bell," which in the latter takes the form of an animal's head. Besides its fundamental tone (B), only its octave can be produced. The other harmonics or overtones, on account of the material and its faulty construction, are absent. Nos. 5 and 6, on the same plate, are trumpets of wood. The mouth-pieces are shallow and cup-shaped, as in No. 9, just described. No. 6 is badly cracked; but No. 5 is entire, and the following tones can be produced from it:

The trumpet is frequently mentioned in the early accounts of Peru. Garcilasso, giving an account of the battle between the army of the Inca Viracocha and the Chancas, says:

"Both armies remained the whole night upon their guard with

sentinels set on each side; and in the morning, by break of day the squadrons arming themselves, with great noise and shouts, with sounds of trumpets, and timbrels, and cornets, they began the onset." [1]

Alonso de Ovalle remarks:

"The sound of the drum and trumpet is only to show them the necessity of their meeting in arms." [2]

Prescott tells us that at the siege of Cuzco (1536)

"The Spaniards were roused by the hideous clamor of conch, trumpet and atabal, mingled with fierce war-cries of the barbarians." [3]

Double Whistling Jar

Fig. 3 of Plate IV shows a double musical water bottle. It consists of two pottery vessels connected near the bottom in such a way that water passes freely from one to the other. Near the top of the first or front jar (usually surmounted by a human or some animal figure) is the opening of the whistle. When the jars have been partly filled and are swung backward and forward, a series of whistling sounds is produced. As the vessel swings forward and upward, the water is lowered in the first jar and raised in the other; in the backward motion it rushes back into the first, forcing the air out through the whistle. It has often been said that the sound emitted by these jars resembles the cry of the animal represented on the vessel. A careful examination of fifty-five of these whistling jars leads to the conclusion that this is the result of a lively imagination—that they are whistles pure and simple.

Fig. 4 of Plate III shows a nondescript instrument made of terra cotta. The tone is produced by blowing into either of the two holes in exactly the same manner that the trumpet is sounded. The lips, in both cases, act as reeds, causing the vibration of the air within the instrument.

[1] Royal Commentaries of Peru, Ed. Rycaut, Part I, Book V, Chap. XVIII.
[2] Historical Relation of Chile, Pinkerton, Vol. XIV, p. 122.
[3] Conquest of Peru. Vol. II, p. 47.

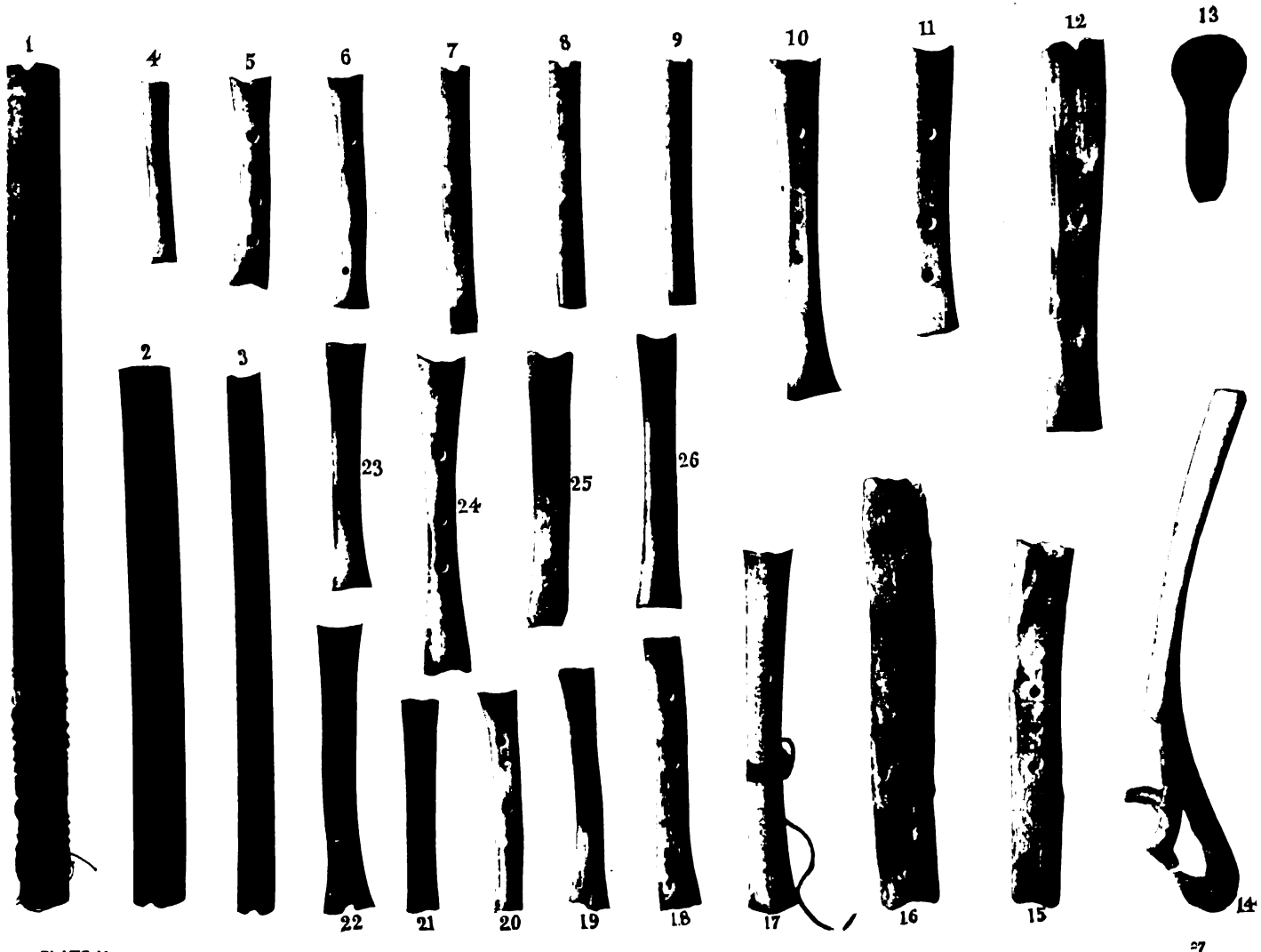


PLATE V

Cornets were used by the Inca's army at the siege of Cuzco. Formerly this name was given to a rude reed instrument of the oboe family, and it is probable that it was similar to those still used in a number of tribes in the Amazon region: a piece of cane from two to five feet long, with one end closed by some gummy substance, through which is passed a split quill which forms the "reed." Herrera tells us that Orellana, on his voyage down the Amazon (1540–1541), was pursued by 130 canoes containing 8000 Indians, and that the noise of their drums, cornets and shouting was a thing frightful to hear.[1]

Cornet

STRINGED INSTRUMENTS.

A NUMBER of modern writers have stated that the *tinya*, a kind of guitar with five strings, was known to the Peruvians in pre-Spanish times. This seems as improbable as Rankin's story of fiddlers being attached to the court of Montezuma.[2] Garcilasso de la Vega, in his chapter entitled "Of the Geometry, Geography, Arithmetick and Musick known to the Indians," gives no account of any stringed instrument.[3] There is scarcely a chapter in the "Cronica del Peru" of Cieza de Leon that does not contain mention of some musical instrument, but we find no hint of instruments of this class. The Peruvians themselves, as we have seen, left behind them many of their instruments and numerous representations of them on their pottery vessels and metal ornaments; but among them all, not one belonging to the lyre type can be found. Professor O. T. Mason says:

"After looking over the musical collection of the United States National Museum and such literature as has been collected by the Bureau of American Ethnology, I have come to the conclusion that stringed musical instruments were not known to any of the aborigines of the Western Hemisphere before Columbus."[4]

[1] Voyage of Francisco de Orellana. Ed. Hakluyt, p. 29.
[2] Conquest of Peru and Mexico by the Mongols, p. 344.
[3] Royal Commentaries of Peru, Ed. Rycaut, Part I, Book II, Chap. XIV.
[4] American Anthropologist, Vol. X, No. 11, 1897.

Professor E. S. Morse agrees with Dr. Mason that there is no evidence of a pre-Columbian stringed device. [1]

I believe that no claim has as yet been made for the existence of the musical bow in Peru; and what Dr. Henry Balfour says of this most primitive of stringed instruments is very important, as showing with what caution the evidence should be considered before pronouncing any instrument to be of pre-Spanish origin:

"In viewing the various types of musical bow to be found in the New World, I must say that I feel that the case of the claims of this instrument to be regarded as indigenous (pre-Columbian) in the Americas can only as yet be dismissed with the verdict of *not proven*. I can find no absolutely convincing evidence to prove the case, and in view of the certainty of many varieties having been introduced by the immigrants from Africa, it will require very strong evidence to establish the claim." [2]

Although not conclusive, such evidence as we have at the present time is against the existence of any form of stringed instrument in Peru before the coming of the Spaniards.

CONCLUSION.

UNDOUBTEDLY the most important instruments were the drum, the various kinds of flutes and the Pan-pipe. Early writers frequently speak of the Indians dancing to the music of the pipe and tabor. The ancient potters have left us representations of these scenes on their water vessels (Plate I, figs. 1 and 2). These dances appear to have remained unchanged in 1649 when Alonso de Ovalle wrote this quaint account:

"Their way of dancing is with little jumps, and a step or two, not rising much from the ground, and without any capers such as the Spanish use; they dance all together in a ring." [3]

Of the music of the Incas we know nothing. A number of songs have been recorded which have been known to the Indians for generations, and believed by them to have been handed down unchanged, but their authenticity is, of course, doubtful—even

[1] Appleton's Popular Science Monthly, March, 1899.

[2] The Natural History of the Musical Bow, pp. 50–51.

[3] Historical Relation of Chile, Pinkerton, Vol. XIV, p. 117.

the source from which they came being uncertain. Negroes were introduced early into all the Spanish colonies, and doubtless many of their tunes were adopted by the Indians. Garcilasso tells us that when he left Peru in 1560 there were then five Indians residing in Cuzco who were great masters on the flute, and could play readily, by book, any tune that was laid before them.[1] In view of these conditions, we may well be sceptical concerning the claims of any music said to be pre-Spanish.

We now come to that much vexed question, What musical scale was known to the ancient Peruvians? In the absence of any authentic music we must look to their instruments as the only source of information. It has been believed commonly that they employed the five-toned or pentatonic scale, so widely used in the primitive music of various peoples, which one of our most eminent musical scholars and critics insists "represents a stage in musical development and is neither a racial nor geographical indication."[2] In this scale the step of a semitone is avoided by omitting the fourth and seventh degrees in major and the second and sixth in minor.

Many of the scales given in this paper seem to indicate the use of this five-toned scale, but there are some puzzling exceptions. Hitherto but few scales of Peruvian instruments have been published. When a sufficient number has been collected, it may be possible to determine the intervals of the Peruvian scale.

[1] Royal Commentaries of Peru, Ed. Rycaut, Part I, Book II, Chap. XIV.
[2] H. E. Krehbiel in *New York Tribune*, Sept. 8, 1901.

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The Knickerbocker Press, New York

AMERICAN MUSEUM OF NATURAL HISTORY

Peruvian Mummies

By CHARLES W. MEAD

Department of Ethnology

GUIDE LEAFLET NO. 24

MARCH, 1907

2 CHULPAS, OR BURIAL TOWERS

Sillustani, Peru

Peruvian Mummies

AND WHAT THEY TEACH

A GUIDE TO EXHIBITS IN THE PERUVIAN HALL

By CHARLES W. MEAD

DEPARTMENT OF ETHNOLOGY

NO. 24

OF THE

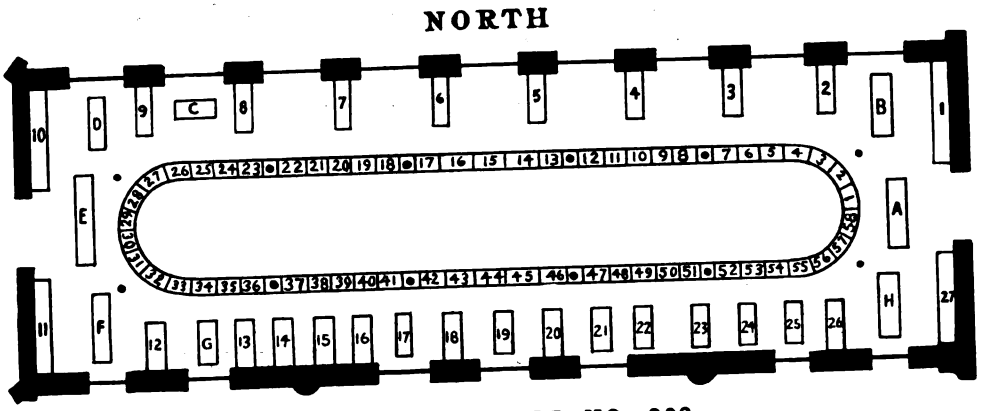
GUIDE LEAFLET SERIES

OF THE

AMERICAN MUSEUM OF NATURAL HISTORY

EDMUND OTIS HOVEY, EDITOR

New York. Published by the Museum. March, 1907



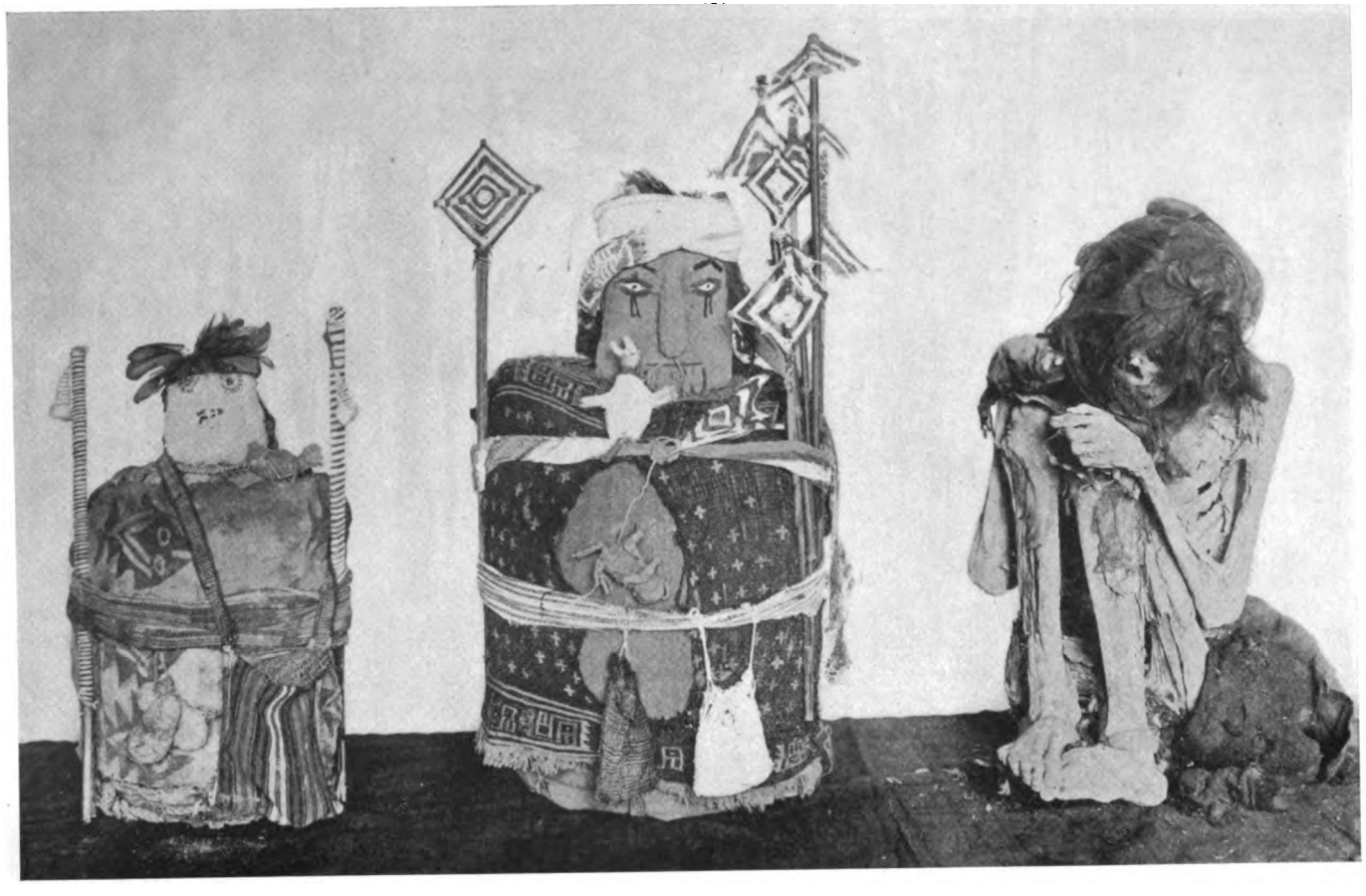
PERUVIAN HALL NO. 302.

Gallery Floor, West Wing.

PRESENT LOCATION OF THE OBJECTS DESCRIBED IN THIS LEAFLET.

	CASE
Mummy bundles	U 27
Mummies	U 27
Prayer sticks	R 4–5
Mummified animals	U 27
Trephined skulls	U 26
Skull Collection	U 26
Implements of war and the chase	U 21
Gold and silver objects	A
Baskets, mats and nets	R 17–18
Cloths	U 1
Materials and implements used in weaving	B
Quipus, or Record Fringes	R 1, 2
Coca leaves and outfit for chewing	R 11
Pottery	U 9, 10, 11, 12 and D, E, F
Chicha jars	On top of U 1, 3, 4, 5, 6, 7, 27
Collection from the West Indies	U 2
Musical Instruments	U 25

"U" refers to the upright cases; "R," to the railing cases.



6

PERUVIAN MUMMY BUNDLES AND MUMMY

PERUVIAN MUMMIES AND WHAT THEY TEACH.

By Charles W. Mead,

Department of Ethnology.

ANCIENT Peru, the land of the Incas, comprised not only the region included within the present Republic of Peru, but also the greater part of Ecuador, Bolivia and Chile and was about equal to that portion of the United States lying east of the Rocky Mountains. The Incas proper were a powerful tribe of warlike people inhabiting the great central plateau, from which dominating position they extended their conquest in all directions. They developed a much higher order of civilization than was found in other parts of the continent by the early European explorers, and the empire under their sway included many tribes speaking different dialects.

The history of the Ancient Peruvians must to a large degree be read in their graves, since they left no written records and the Spanish conqueror destroyed many of their cities and suppressed their customs. Like many other peoples the Peruvians bestowed much tender care on their dead, carefully preparing them for burial and placing with them in the ground many objects which were dear to them in life. Methods of burial are so intimately connected with the religious and other customs of a people that in the absence of other sources of information a study of graves or tombs may be expected to lead to important results. Fortunately for the archæologist, climatic conditions in some parts of Peru are such that "burials" have been well preserved. The region west of the Peruvian Cordillera, a narrow strip along the coast, is in the main a desert, the only fertile spots being the narrow valleys of the small rivers flowing down to the Pacific.[1] The tombs and graves are usually found on elevated places outside of the valleys where the extreme dryness of the air combines with the nitrous character of the sand, into which moisture has seldom found its way, to desiccate and preserve the bodies of the dead thus mummifying them naturally. The same factors have

Importance of the Burials

[1] The visitor is referred to the relief map of South America on the left as he enters the hall for a clear exposition of the topographic features of the region.

caused the clothing and objects placed with the dead to be preserved for many centuries.

As a rule the bodies were prepared for burial by placing them in a sitting position with the knees drawn up and the head and hands resting upon them, as is shown in the right-hand figure on page 6. Sometimes, however, as appears from burials in the Chira Valley, in the extreme northwest of Peru, the body was extended at full length. A few of the extended bodies have been found in other parts of the country, and two examples of this form from Surco, Peru, are in the collection. After the body was placed in position, it was enveloped in wrappings of various kinds. Sometimes the body was covered with fine cotton cloth, over which were placed finely woven blankets or ponchos of the wool of the vicuña or the alpaca, with designs in various colors.

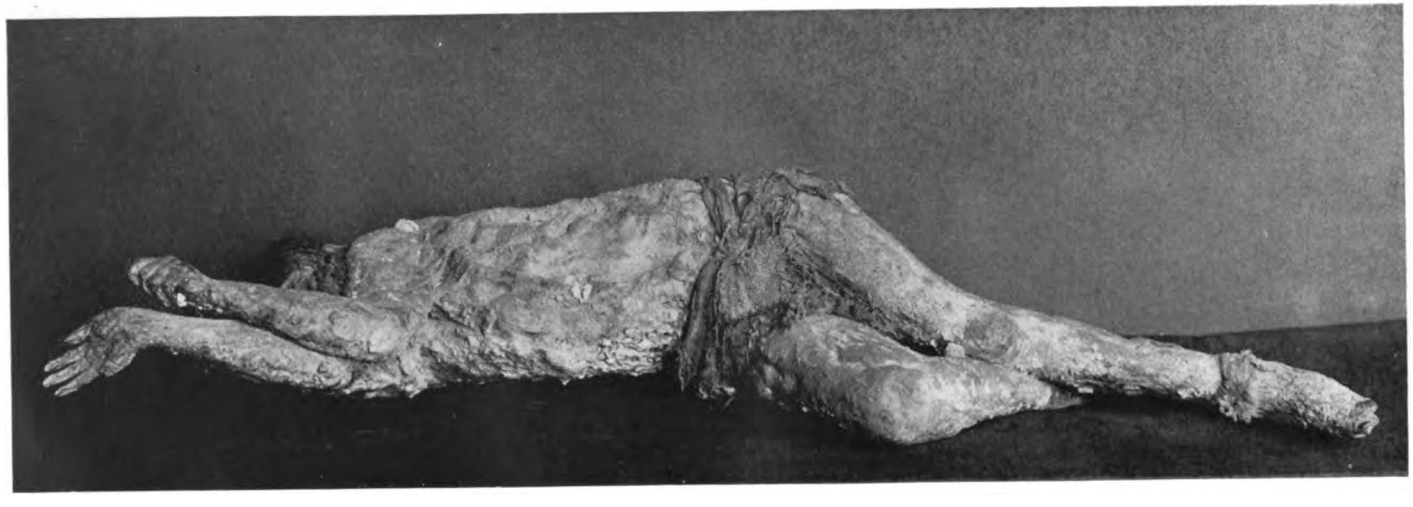
Preparation for Burial

The body and its wrappings were bound together by a net-work of stout cord of vegetable fibre; by a piece of strong cloth sewed together in the form of a closed sack, or in some localities by a casing of woven rushes. The "mummy bundle" was surmounted by the so-called "false head," which was sewed to its upper surface. The significance of this practice is unknown. These false heads, many of which are present in the collection, were made of cloth and filled with different vegetable substances. The face was represented in various ways: sometimes by a mask of wood or clay, but often the eyes, nose and mouth were made of wood, shell, gold or silver and fastened directly to the cloth by means of thread. To the outside of the mummy bundle were often attached several of the prayer sticks or sepulchral tablets which are frequently found in considerable numbers in the sand about the grave. These are either in the form of a cross wound with variously colored yarns, or a framework of split reeds, covered with cloth upon which rude designs are painted. Favorite animals were sometimes buried with the dead as is shown by the mummified bodies of a dog and a parrot in the collection.

Mummy Bundles

The manner of interment of the mummy bundle and its accompaniments differed in various localities. In the coast region many of the mummies are found in little vaults, or "huacas," of adobes or flat stones roofed with sticks or canes, overlaid with mats or a layer of rushes, which prevented the earth covering from filling the grave. These vaults usually contain from one to four bodies.

Huacas



10 NATURALLY MUMMIFIED BODY

Copper Mine at Chuquicamata, Chile

Burials in stone towers or "chulpas" seem to have been confined chiefly to the Aymará Indians of the Callao, the great plateau of the Andes which includes the basin of Lake Titicaca and lies between the two maritime cordilleras and the eastern range, out of which rise the lofty volcanic peaks of Illimani and Sorata. In plan these chulpas are either circular or rectangular and are spoken of as round or square towers. A round burial tower is shown on page 2. Dr. von Tschudi found chulpas in the Department of Junin, which may have been built by Aymará *mitimaes*, or translated colonies. Describing the burial towers near Palca, E. G. Squier says:[1] "Primarily these chulpas consisted of a cist, or excavation, in the ground about four feet deep and three feet in diameter, walled up with rough stones. A rude arch of converging and overlapping stones, filled in or cemented together with clay, was raised over this cist, with an opening barely large enough to admit the body of a man, on a level with the surface of the ground, towards the east. Over this hollow cone was raised a solid mass of clay and stones, which, in the particular chulpa I am now describing as a type of the whole, was 16 feet high, rectangular in plan, 7½ feet face by 6 feet on the sides. The surface had been rough-cast with clay, and over this was a layer of finer and more tenacious clay or stucco, presenting a smooth and even surface."

Chulpas

One of the most remarkable specimens that the Department of Ethnology has acquired is a naturally mummified body which was found in an old copper mine at Chuquicamata, Province of Antofagasta, Chile, and which is illustrated on page 10. The condition of the body shows that the unfortunate miner was caught by a cave-in of the roof and partly crushed. The mummification seems to have been produced in part by the action of copper salts and not to have been altogether a desiccation due to the dryness of the region. The skin has not collapsed on the bones, as in the mummies found usually in the region, but the body and limbs preserve nearly their natural form and proportions, except for the crushing already mentioned. No analysis has yet been made of the tissues, so that it is too early to hazard any supposition as to the chemical changes which they have undergone. Mines in this neighborhood have been worked for an unknown length of time upon a peculiar deposit of atacamite, a

Natural Mummy

[1] Squier's Peru, p. 243.

hydrous chloride of copper, which is much prized on account of its easy reduction. The age of the mummy is unknown, but it is supposed to be pre-Columbian.

Weapons and Implements

The story told by the objects found with the Peruvian dead is in part the story of ancient Peruvian life. The objects in the Peruvian collection in the hall, most of which have come from graves and mummy bundles, have been arranged so as to tell part of this story. For example we find with the bodies of men slings for throwing stones, stone-headed clubs and bolas (rounded stones joined by cords), showing the weapons and implements of war and the chase. With the mummy bundle of the woman have been found work-baskets, filled with threads and yarns of various colors, needles of thorn and copper, the implements used in weaving, such as spindles and shuttles, or the stones used in smoothing and polishing the outside of pottery vessels. Woman's work in ancient Peru is indicated by the presence or absence of objects familiar to us of the present day. Corn, beans and other foods were usually placed beside the body in the grave, together with vessels used in eating and drinking. These objects indicate not alone the belief of the people in a future world and the necessity of sustaining the spirit in its journey thereto, but they also show that the people were well advanced in agriculture, and we are enabled to determine the kinds of plants cultivated and in many cases even the methods by which they were prepared for use.

EAR OF CORN. FOUND WITH A MUMMY

Furthermore the objects found in the graves prove that in the working of copper, silver and gold the ancient Peruvians take high rank, and

CUP OF BEATEN GOLD AND STRING OF GOLD BEADS

show that the people knew how to exploit and treat the ores occurring in their land. Among copper implements there may be seen in the collection a great variety of spear points, club-heads, digging and planting implements, knives and axes. Tweezers are among the most familiar objects from the graves, and are often found suspended from the neck of a mummy by means of a cord.

Use of Copper

Some of the most notable of the gold objects are a cup beaten from a single piece, and ornamented in repoussé-work; human and animal figures, both solid and hollow, and beads and pins. The illustration on page 13 shows the gold cup and a string of large gold beads. In silver there are cups and vessels which, like the gold cup, are beaten from single pieces and are often ornamented with human or animal figures and other designs. Silver tweezers in many fanciful forms, pins and a variety of ornaments have been found in and with the mummy bundles. These objects prove that the makers were familiar with the processes of casting in moulds, beating and soldering. Many of the hollow figurines were made in three or more pieces and the parts soldered together.

Gold and Silver

Another remarkable class of objects is to be found on the right as one enters the hall. Here are many garments and pieces of cloth which were found wrapped around the dead or deposited in the graves. A glance at this part of the collection will show the ancient Peruvians had great skill in the art of weaving. Upon closer examination it will appear that they were familiar with most of the weaves known to modern people, from the finest gobelins to the coarsest cotton cloth. Many of the specimens cannot be excelled at the present time. The looms used were of the simplest description, consisting of two cross-sticks, one at the top, and the other at the bottom. The warp threads were stretched from one to the other, while the woof or filling was passed over and under these by a shuttle. So the weaving of these most perfect fabrics may be said to have been by hand. In this respect they may stand in contrast to the modern machine methods. In addition to the excellence of weave Peruvian cloth is unique in decoration. The designs are woven in and consist of geometric figures and conventionalized representations of men, pumas, jaguars and various kinds of birds and fish. Some of the forms are illustrated on page 16. A part of the decorative effect is due to the regular repetition of the same design in different colors.

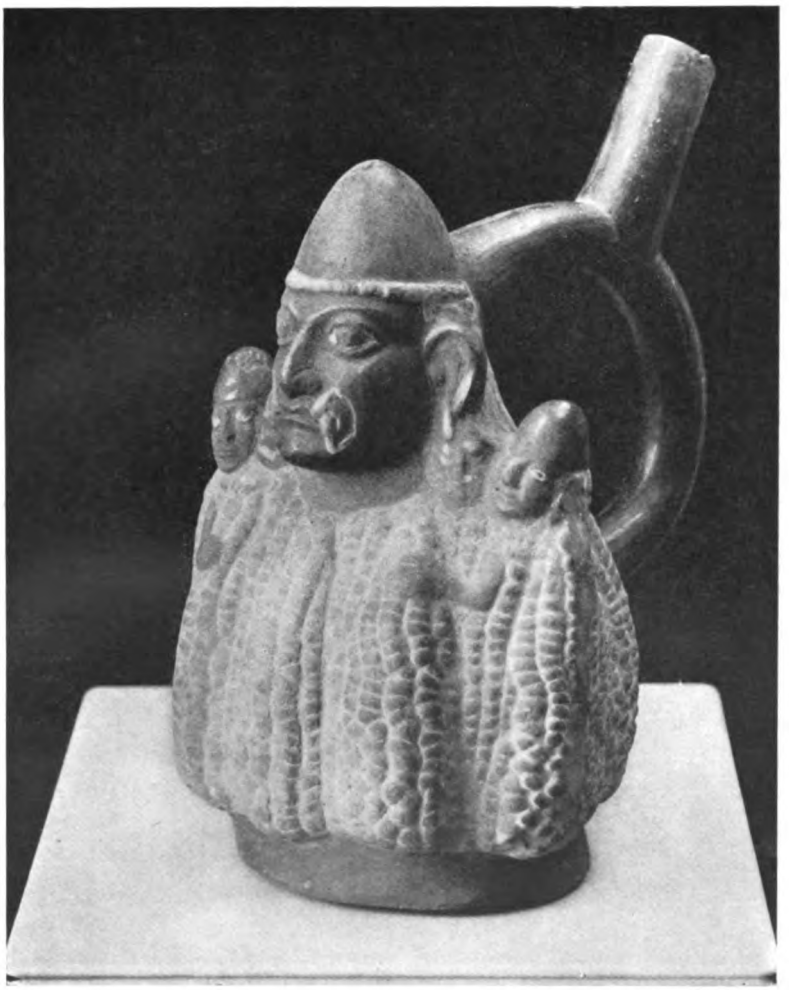
Cloth and Weaving

That the Peruvian should also take high rank as a potter will be gathered from even a superficial study of the collection of all forms of pottery at the west end of the hall, since many of the vessels show real beauty of outline and form and excellence in their painted decoration. These qualities seem the more remarkable when we consider that the

PIECES OF CLOTH FOUND WITH MUMMIES

Pottery

makers had no knowledge of the potter's wheel and were unacquainted with the art of glazing. Some of the vessels were shaped by hand, but others show that they were formed by means of moulds. The body was moulded in two parts which were joined by being pressed together. Spout or handle, if desired, was then attached, and all irregularities in the junctures remedied by scraping and rub-



POTTERY WATER-JAR WITH CORN DECORATION

bing. Moulds were often used in making many of the animal heads and human figures that adorn these vessels. The decoration was put on with paint, and, after firing, the vessels were polished by rubbing with a smooth pebble.

In the absence of an aboriginal written language in Peru and on account of the meagreness of the descriptions left by the first Europeans who visited the country, it is fortunate for the student of Peruvian archæology that the potter often represented by the shape of his vessel or in its

POTTERY VESSEL WITH PAINTED DECORATION

decoration forms and customs which were familiar to him in his every-day life.

Representations of the human figure are common. Some of these show the manner of wearing the poncho and other articles of clothing. Some have in the lobe of the ear the large cylindrical ear-ornaments which led the Spaniards to nickname these people "Orejones" — big ears. It would be impracticable, however, to mention here more than a few of the subjects depicted. On one vessel a man pursues and kills a deer with a spear; on another a hunter is returning with the body of a deer thrown across his shoul-

Human figures

ders. Some jars show the manner of catching fish by means of hook and line, while others portray men and women carrying water jars and other burdens by means of a strap passing around the forehead. Here we see a man with his favorite bird, evidently of the parrot family, perched upon his shoulder; there a dance in progress, with several of the figures playing upon musical instruments.

These potters were very fond of moulding their clay into animal forms, and they have left us more or less truthful representations of many of the species familiar to them. Their favorite models appear to have been the puma, jaguar, monkey, llama, Guinea-pig, lizards, birds of the parrot family, the king vulture and a number of shells and vegetable forms. A complete list would include most of the animal and many of the vegetable forms of Peru.

Animal figures

Everywhere, except in the most elevated parts of the country, maize was not only the staple food of the people, but also was the source of their favorite intoxicating beverage,— *chicha*; hence it was but natural that they should so often represent the grain on their vessels. This was very simply and perfectly accomplished. A mould was made from an ear of corn and dried in the sun or fired. Into this clay was pressed; which on being removed would be a facsimile of the ear. This was joined to the jar while both were still in a plastic condition, after which the whole was fired and polished. A corn jar is represented in the illustration on page 17.

Chicha

Although this guide relates chiefly to burials, it may not be out of place to call attention to some peculiarities of Peruvian skulls. The skulls of all races are of great scientific value, but those of Peru are of particular interest, because many of them bear the marks of surgical or sacrificial operations. The Museum collection of Peruvian skulls is so extensive that only a representative series is on exhibition. This contains many examples showing trephining, artificial deformation and pathological conditions, together with several normal Peruvian skulls for purposes of comparison.

Trephined skulls

In Peru, where stones from slings and wooden clubs with heads of stone and copper were the common offensive weapons, complex fractures of the skull with depression of its bony plates must have been common. There seems no reason to doubt that trephining was resorted to as a means of relief in such fractures, and that sometimes cures were effected by this treatment. It is also probable that the operation in many

21 TREPHINED SKULLS FROM ANCIENT PERUVIAN GRAVES

cases was a part of some religious ceremonial, since some of the trephined skulls in the collection show distinct orientation of the wound and present no indication of lesion. Implements of copper and bronze and knives of stone and obsidian must have been employed in the operation, which was performed with skill.

Artificial deformation of the head was extensively practised in ancient Peru and was accomplished by means of ligatures applied in infancy. The form taken by the head was determined by the manner in which these bindings were applied. The pathological skulls show the ravages of disease in the bones of the cranium.

THE QUIPU.

The Quipu is a fringe consisting of a main cord with other cords of various colors hanging from it. In the fringe knots of different kinds were tied. The ancient Peruvians, having no written language, made use of the quipu to keep their accounts and possibly to record historic incidents. By the color of the cord, the kind of knot, the distance of the knots from the main cord and from each other, many facts could be recorded and preserved. The maker of a quipu had a system which was to a great extent arbitrary, and which had to be explained when the quipu was placed in the keeping of another.

COCA CHEWING.

The coca plant (*Erythroxylon coca*, Lam.) grows wild in the mountainous regions of Peru and Bolivia and was cultivated before the Conquest, as it is to-day, in districts from 2,000 to 5,000 feet above the sea. It is valued for its stimulating narcotic properties, and the present Indians will often carry heavy burdens for several days without food, if furnished with a plentiful supply of coca. The leaves are gathered and dried in the sun and then chewed mixed with unslacked lime in the same way the betel is used by the East Indians. A bag of coca leaves is almost always found with a mummy. The leaves of this plant, together with the cloth bags in which they were carried and the gourd flasks containing lime may be seen in the collection.

MISCELLANEOUS EXHIBITS.

This gallery contains many exhibits, some of them very important, of which no special mention has been made, since it is believed that the case labels and the guide leaflets attached to the cases will furnish the desired information to the student and visitor. Among these may be mentioned the collection from the West Indies, the musical instruments of the Incas, the case containing a great variety of animal forms in pottery; collections of feather-work from Peru, Bolivia, Paraguay and Brazil, and the collection from Columbia consisting of many objects in pottery, stone and shell.

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